THE

VETERINARY JOURNAL

JULY, 1914.

ONE OF A PAST GENERATION.

A SHORT time ago there died at Ravensthorpe, a village in Northamptonshire, a very old man who had had, in his day, a great reputation as a cow doctor and castrator. He was quite a character in his way, and owed the commencement of his career to association with two brothers, "cow doctors and horse farriers," who used to come into his neighbourhood to attend sick animals when sent for by the farmers. On such occasions it was John Russell's delight if he could obtain permission to accompany and help them, and in this way he picked up some knowledge of the mysteries they practised. When sent for to a sick cow, if he did not recognize the disease his invariable diagnosis was that the beast was suffering from "overflow of the gall," and, as might be expected, he did not lose his chance of a fee by not administering something and paving the way for another visit.

The photograph shows him in the donkey cart which some friends of the old man provided to enable him to get about in his declining years, and his reminiscences of some of the wonderful cures he had effected in his time would almost come up to those which are occasionally related, even to-day, in higher professional circles, when the brethren are collected together.

Editorials.

THE MILK AND DAIRIES BILL, 1914.

THIS Bill, at present before Parliament, probably destined to come into effect on January 1 next, is one of great importance to the veterinary profession, and it is therefore unnecessary for us to offer any apology in discussing the proposals somewhat fully. The Bill, which we publish in full on another page, renders guilty of an offence, any person who

(*a*) Sells, or offers or exposes for sale, or suffers to be sold or offered or exposed or sale, for human consumption or for use in the manufacture of products for human consumption ; or
(*b*) Uses or suffers to be used in the manufacture of products for human consumption ;

the milk of any cow which has to his knowledge given tuberculous milk, or which is suffering from emaciation due to tuberculosis, or from tuberculosis of the udder, or from acute inflammation of the udder, or from any disease liable to infect or contaminate the milk, unless he proves that he did not know and had no reason to suspect that the milk so sold or offered or exposed for sale or used was the milk of such a cow.

The Bill proposes to empower the Local Government Board to make General and Special Orders for the registration of dairies with local authorities, and for their inspection of persons employed in or about dairies ; for the prevention of the sale for human consumption of infected, contaminated or dirty milk, or the milk of a diseased cow.

Sub-section 3 of Clause 2 places on the Local Government Board the main responsibility for executing the terms of the Act, which shall, however, be done with the concurrence of the Board of Agriculture and Fisheries. We fear that this somewhat ambiguous division of authority between two State Departments may lead to confusion in the future.

One of the first things that must strike the veterinary critic in reading the Bill is the subsidiary position into which the veterinary surgeon is pushed on this primary veterinary subject. It is the Medical Officer of Health of any local authority and not the Veterinary Surgeon, either alone or jointly with the Medical Officer of Health, on whom the Act seeks to place the main responsibility of notification and control. Clause 3, for instance, states that if the Medical Officer of Health of a county or county borough is of

opinion that tuberculosis is caused, or is likely to be caused, through milk supplied from any dairy within his area, then the Act shall have effect, &c. No mention here of the veterinary surgeon even being consulted.

In sub-section 3 of clause 4 we are at last informed that sufficient notice of the time of the inspection must be given to the local authority whose medical officer of health gave the notice, to allow that officer, *or a veterinary inspector or other veterinary surgeon appointed by the authority*, to be present at the inspection if the authority so desire.

Throughout these various clauses, and in fact, throughout the Bill, there runs the settled conviction that those who have drawn the Bill regard the veterinary authority as a mere hewer of wood and a drawer of water for the doctor, even on highly technical matters in which the veterinary surgeon must have a greater and more specialized knowledge. This result in which modern legislation affects our profession is in a large part due, we are bound to say, to the apathy and lack of public spirit shown by members of our profession in impressing our corporate claims on public authorities; and we cannot entirely acquit those high in authority in our profession, both official and non-official, of having contributed to this deplorable state of affairs by their masterly inactivity in the past.

From other points of view the Bill must be regarded as a laudable attempt on the part of the legislature to deal with one of the root causes of the "great white plague."

Clause 7 is of particular interest to our profession. It confers on local authorities the power, and when required by the Local Government Board makes such action compulsory, to appoint, or combine with another local authority in appointing, one or more veterinary inspectors for the purposes of the Act.

Provision is also made to deal with the importation of foreign milk.

We strongly recommend the profession to take the Bill into careful consideration in their own interests. It is another milestone in the rapid march which society is making towards the social control of vital industries, and in that social control our profession will be called upon to take a large and essential part. Whether that part is to be properly recognized and adequately remunerated depends in a large measure on the policy we now pursue with regard to such legislation.

VETERINARY RESEARCH.

A GOOD deal of feeling has lately been aroused on the above subject in regard to whether researches into the diseases of animals should be carried out in purely veterinary laboratories, or whether the collaboration of laboratories connected with medical schools should be sought. That the study of disease should know no distinctions or limits will be admitted on all sides, and whether the cures come from the brains and ideas of a veterinary surgeon, or whether they come from a man who holds a human medical qualification is immaterial, provided it is there and can be practically and serviceably applied.

All these researches, however, cost money, and unfortunately in Great Britain the funds set aside for the purpose are miserably inadequate, so that those who distribute them have to very seriously consider where they shall be placed in order to offer the best prospects of a profitable return.

We of the veterinary profession can allow no argument as to who are the best trained section of the community to deal with the diseases of animals, and as the funds allotted to veterinary research are so small, we are particularly anxious that they shall come to the veterinary laboratories, which, few as they are in number, certainly contain the requisite capacity and technical skill for the proper discharge of the work.

That more veterinary laboratories are needed in which animal researches can be carried out is a fact which everyone admits, and if only the funds necessary for their proper equipment and every-day expenditure could be provided, either by the State or by some generous philanthropist, the profession could at once do the rest by furnishing skilled and properly trained men capable of carrying out researches which would be of inestimable value to the stock-owner and breeder, and indirectly perhaps to the human species, which shares so many diseases in common with animals.

PERSONAL.

WE hear that Mrs. Share-Jones, the wife of the very able Editor of our contemporary, the *Veterinary News*, has just passed her final examination for the degree of LL.B. with first-class honours. We understand she is the first woman to graduate in this country in the faculty of Law. We tender our respectful congratulations to Mrs. Share-Jones on a remarkable academic success.

A BILL TO MAKE BETTER PROVISION WITH RESPECT TO THE SALE OF MILK AND THE REGULATION OF DAIRIES.

BE it enacted by the King's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows :—

1. If a person—

(*a*) Sells or offers or exposes for sale, or suffers to be sold or offered or exposed for sale, for human consumption or for use in the manufacture of products for human consumption ; or

(*b*) Uses or suffers to be used in the manufacture of products for human consumption ;

milk of any cow which has to his knowledge given tuberculous milk, or which is suffering from emaciation due to tuberculosis, or from tuberculosis of the udder, or from acute inflammation of the udder, or from any disease liable to infect or contaminate the milk, he shall be guilty of an offence against this Act, unless he proves that he did not know and had no reason to suspect that the milk so sold or offered or exposed for sale or used was the milk of such a cow.

2.—(1) The purposes for which general and special orders with respect to milk and dairies, hereinafter referred to as Milk and Dairies Orders, may be made by the Local Government Board under section thirty-four of the Contagious Diseases (Animals) Act, 1878, as amended by the Contagious Diseases (Animals) Act, 1886, shall include the following purposes :—

(*a*) the registration of local authorities of dairies ;

(*b*) the inspection of dairies and persons employed in or about dairies ;

(*c*) the prevention of the sale for human consumption or for use in the manufacture of products for human consumption, of infected, contaminated, or dirty milk or the milk of a diseased cow ;

(*d*) the prohibition of the addition of colouring matter and the prohibition or regulation of the addition of skimmed or separated milk, or water, or any other substance, to milk intended for sale for human consumption, and the prohibition or regulation of the sale for human consumption of milk to which such an addition has been made.

(*e*) the regulation of the cooling and conveyance of milk intended for sale for human consumption ;

(*f*) the labelling or marking of receptacles of milk for sale for human consumption and the identification of churns and vessels used for the conveyance of such milk.

(2) If any person is guilty of a contravention of or non-compliance with the provisions of any Milk and Dairies Order, he shall be guilty of an offence against this Act.

(3) General Milk and Dairies Orders shall be made by the Local Government Board with the concurrence of the Board of

Agriculture and Fisheries, and shall have effect as if enacted in this Act.

(4) All general Milk and Dairies Orders shall be laid before each House of Parliament as soon as may be after they are made ; and if an Address is presented to His Majesty by either House of Parliament within the next subsequent forty days on which that House has sat next after the order is laid before it praying that the order may be annulled, it shall thenceforth be void, but without prejudice to the validity of anything previously done thereunder or to the making of a new order.

The Rules Publication Act, 1893, shall apply to any such order as if it was a statutory rule within the meaning of section one of that Act.

3.—(1) If the medical officer of health of a county or county borough is of opinion that tuberculosis is caused, or is likely to be caused, by the consumption of the milk supplied from any dairy within the county or county borough in which cows are kept, the provisions of the First Schedule to this Act shall have effect with respect to the reports to be made and the steps to be taken with a view to stopping the supply of milk from the dairy, and with a view to stopping such supply orders may be made in accordance with that Schedule, subject to such right of appeal and the payment of compensation in such cases as are provided therein.

(2) Where an order stopping the supply of milk is made under the said Schedule a dairyman shall not be liable for an action for breach of contract if the breach is due to such order.

(3) If any dairyman whilst any order made in accordance with the said Schedule prohibiting the supply or use of milk is in force supplies or uses any milk in contravention of this order he shall be guilty of an offence against this Act.

(4) The Local Government Board may by order direct that the council of any non-county borough within the county, which is a local authority for the purposes of the Diseases of Animals Acts, 1894 to 1911, shall exercise and perform within the borough the powers and duties of the county council under this and the next succeeding section, and where such an order has been made with respect to any non-county borough this and the next succeeding section shall apply as if the borough were a county borough.

4.—(1) If the medical officer of health of any local authority has reason to suspect that tuberculosis is caused, or is likely to be caused, by the consumption of any milk which is being sold or exposed or kept for sale within the area of the local authority he shall endeavour to ascertain the source or sources of supply, and on ascertaining the facts shall forthwith give notice of them to the medical officer of health of the county or county borough in which the cows from which the milk is obtained are kept, whether the dairy where they are kept is within or without the area of the local authority, unless the local authority are themselves the council of that county or county borough.

(2) On the receipt of such notice it shall be the duty of the medical officer of health of the county or county borough to cause the cattle in the dairy, and, where the case so requires, the persons

employed therein, to be inspected, and to make such investigations as may be necessary.

(3) Sufficient notice of the time of the inspection shall be previously given to the local authority whose medical officer of health gave notice, to allow that officer or a veterinary inspector or other veterinary surgeon appointed by the authority being present at the inspection if the authority so desire.

(4) The council of the county or county borough on whose medical officer of health the notice is served shall send to the medical officer of health of the local authority who gave the notice copies of any reports which may have been made by the medical officer of health making the inspection, and of any veterinary or bacteriological reports which may have been furnished to him, and shall give him information as to whether any action has been taken upon those reports and as to the nature of that action.

5.—(1) It shall be lawful for an inspector of the Local Government Board, or the medical officer of health of a local authority, or any person provided with and, if required, exhibiting an authority in writing from such an inspector or from the local authority or medical officer of health, to take for examination samples of milk at any time before it is delivered to the consumer:

Provided that the powers of a medical officer of health and of a person authorized by him or by the local authority under this section shall, except so far as the Local Government Board may otherwise direct, be exercisable only within the area of the local authority.

(2) The result of an analysis or bacteriological examination of a sample of milk taken under this section shall not be admissible as evidence in proceedings under this Act, or in proceedings under the Sale of Food and Drugs Acts, 1875 to 1907, unless the provisions of the last-mentioned Acts which relate to the division of samples into parts are complied with, but if those provisions have been complied with, the result of the analysis shall be available for proceedings under the said Acts (as if it had been procured in accordance with those Acts) as well as for proceedings under this Act.

(3) The medical officer of health or any other officer authorized for the purpose by a local authority within the area of which milk from any dairy situate outside that area is being sold or exposed or kept for sale, may by notice in writing require the medical officer of health or authorized officer of any other local authority to take samples of the milk from that dairy in the course of transit or delivery to premises within the area of the first-mentioned local authority.

(4) Upon receipt of such notice it shall be the duty of the medical officer of health or other authorized officer of the other authority to take samples and to forward, for analysis or bacteriological examination, to the officer who gave the notice a part of any sample so taken, and in taking a sample the officer shall, if so required by the notice, comply with the provisions of the Sale of Food and Drugs Acts, 1875 to 1907, which relate to the division of samples into parts.

The authority requiring the samples to be taken shall be liable to defray any reasonable expenses incurred, the amount whereof shall in default of agreement be settled by the Local Government Board.

For the purpose of the Sale of Food and Drugs Acts, 1875 to 1907, the sample shall be deemed to have been taken by the officer who gave the notice, and proceedings under those Acts may be taken either before a court having jurisdiction within the district for which that officer acts or before a court having jurisdiction in the place where the sample was taken.

6. The provisions of the Sale of Food and Drugs Acts, 1875 to 1907, in reference to the taking of samples of milk, and any proceedings in connection therewith, shall be amended in accordance with the provisions contained in the Second Schedule to this Act.

7.—(1) A local authority may, and when required by the Local Government Board shall, appoint or combine with another local authority in appointing one or more veterinary inspectors or employ for the purposes of this Act and the Milk and Dairies Orders any veterinary inspector appointed under the Diseases of Animals Act, 1894, and any local authority may, and when required by the Local Government Board shall, provide or arrange for the provision of such facilities for bacteriological examinations of milk as may be approved by the Board.

(2) Any order requiring a combination of local authorities for the purposes of this section may provide for all matters incidental to such combination, and in particular how the expenses incurred are to be apportioned.

8. The Local Government Board shall make regulations under the Public Health (Regulations as to Food) Act, 1907, for the prevention of danger arising to public health from the importation of milk intended for sale for human consumption.

9.—(1) The sanitary authority of any district may, with the approval of the Local Government Board, establish and thereafter maintain depôts for the sale of milk specially prepared for consumption by infants under two years of age, and purchase and prepare milk and provide such laboratories, plant, and other things, and exercise and perform such other powers and duties, as may be necessary for the purposes of this section.

(2) The Local Government Board may attach such conditions to their approval as they may deem necessary.

10.—(1) If a local authority fail to fulfil any of their duties under this Act, or under any Milk and Dairies Order, the Local Government Board may after holding a local inquiry make such order as they think necessary or proper for the purpose of compelling the authority to fulfil their duties, and any such order may be enforced by mandamus.

(2) When the authority in default is a district council, the Local Government Board may determine that all or any of the powers of the council under this Act or the Milk and Dairies Orders be transferred to the county council, and those powers shall be transferred accordingly, and section sixty-three of the Local Government Act, 1894, shall apply as if the powers had been transferred under that Act.

11. If any person obstructs any inspector or other officer of the Local Government Board or any medical officer of health, or any veterinary inspector or surgeon, or other officer of or person employed by a local authority, in the execution of his powers under this Act or any Milk and Dairies Order, or fails to give any such officer all reasonable assistance in his power, or to furnish him with any information he may reasonably require, he shall be guilty of an offence against this Act.

12.—(1) The Local Government Board may by order apply for the purposes of this Act the provisions of any public general Act relating to the holding of local inquiries by the Local Government Board, and the expenses of such inquiries, and the powers of the persons holding any such inquiry, and the manner in which notices may be served.

(2) A local authority may delegate to a committee any of their powers or duties (other than the power of raising rates) under the provisions of this Act or of any Milk or Dairies Order, and in such case anything required or authorized by those provisions to be done to or by the local authority may be done to or by the committee to which such powers and duties have been so delegated.

(3) For the purpose of the exercise and performance of their powers and duties by sanitary authorities under this Act and the Milk and Dairies Orders the purposes of this Act and those Orders shall be deemed to be included amongst the purposes of the Public Health Act, 1875, or the Public Health (London) Act, 1891, as the case may require.

(4) Any inspection of cattle made in pursuance of this Act or any Milk and Dairies Order shall be carried out by a veterinary inspector or other properly qualified veterinary surgeon.

13. The expenses of local authorities under this Act and the Milk and Dairies Orders shall be defrayed—

(*a*) in the case of a county council, out of the county fund, as expenses for general county purposes, or, if an order of the Local Government Board so directs as respects any such expenses as expenses for special county purposes charged on such part of the county as may be provided by the order ;

(*b*) in the case of the common council, out of the general rate ;

(*c*) in the case of the council of a metropolitan borough as part of the expenses incurred by the council in the execution of the Public Health (London) Act, 1891 ;

(*d*) in the case of the council of a municipal borough or urban or rural district, as part of their general expenses incurred in the execution of the Public Health Acts.

14.—(1) If any person commits an offence against this Act, he shall be liable on summary conviction to a fine not exceeding in the case of a first offence five pounds and in the case of a second or subsequent offence fifty pounds, and if the offence is a continuing offence to a further fine not exceeding forty shillings for each day during which the offence continues.

(2) Proceedings against a dairyman for failure to comply with an order made under the First Schedule to this Act requiring the dairyman not to supply milk from a dairy may be taken before a court of summary jurisdiction either in the place where the offence was committed or in the place where the dairy is situated, and shall be taken only by the authority by which the order was made.

(3) Where the occupier of a dairy is charged with an offence against this Act, he shall be entitled upon information duly laid by him to have any other person whom he charges as the actual offender brought before the court at the time appointed for hearing the charge; and if, after the commission of the offence has been proved, the occupier of the dairy proves to the satisfaction of the court—

(*a*) that he has used due diligence to enforce the execution of this Act and the Milk and Dairies Orders; and

(*b*) that the said other person had committed the offence in question without his knowledge, consent or connivance;

that other person shall be summarily convicted of the offence, and the occupier shall be exempt from any fine, and the person so convicted shall, in the discretion of the court, be also liable to pay any costs incidental to the proceedings.

(4) When it is made to appear to the satisfaction of the authority by or on whose behalf proceedings are about to be taken—

(*a*) that the actual occupier of the dairy has used all due diligence to enforce the execution of this Act and the Milk and Dairies Orders; and

(*b*) by what person the offence has been committed; and

(*c*) that it has been committed without the knowledge, consent, or connivance of the occupier of the dairy and in contravention of his orders;

proceedings shall be taken against the person who is believed to be the actual offender without first proceeding against the occupier of the dairy.

(5) It shall be the duty of the local authority to take proceedings for enforcing the provisions of this Act and of Milk and Dairies Orders, and the clerk of the local authority or other officer whom the local authority may appoint shall have power, if so authorized by the local authority, to institute and carry on such proceedings.

(6) All fines imposed in any proceedings instituted by or on behalf of a local authority in the exercise of their powers and duties under this Act shall be paid to the authority and carried to the credit of the fund out of which the expenses incurred by the authority under this Act are defrayed.

15.—(1) In this Act and in the Contagious Diseases (Animals) Act, 1878, and the Contagious Diseases (Animals) Act, 1886, unless the context otherwise requires—

The expression "dairy" includes any farm, farmhouse, cowshed, milk store, milk shop, or other place from which milk is supplied on or for sale or in which for purposes of sale or manufacture into butter, cheese, dried milk or condensed milk for sale, milk is kept or used, and, in the case of a purveyor of

milk who does not occupy any premises for the sale of milk, includes the place where he keeps the vessels used by him for the sale of milk, but does not include a shop from which milk is not supplied otherwise than in the closed receptacles in which it was delivered to the shop, or a shop or other place in which milk is sold for consumption on the premises only ;

The expression "milk" includes cream, skimmed milk, and separated milk ;

The expression "dairyman" includes any occupier of a dairy, cowkeeper, or purveyor of milk ;

The expression "purveyor of milk" includes a seller of milk, whether wholesale or by retail ;

The expression "medical officer of health" includes any duly qualified medical practitioner authorized by the council to act on behalf of the medical officer of health ;

The expression "veterinary inspector" means an inspector being a member of the Royal College of Veterinary Surgeons, or having such other qualifications as may be approved by the Board of Agriculture and Fisheries ;

The expression "sanitary authority" as respects London means the sanitary authority for the purposes of the Public Health (London) Act, 1891, and elsewhere the council of a borough or of an urban or rural district, and the expression "sanitary district" means the district of such authority ;

The expression "common council" means the mayor, aldermen, and commons of the City of London in common council assembled.

(2) Where milk is sold or exposed or kept for sale it shall be presumed to be sold or exposed or kept for sale for human consumption or for use in the manufacture of products for human consumption, unless the contrary is proved.

(3) Where milk is kept in any dairy, or in the custody or possession of any dairyman, it shall be presumed to be kept for purposes of sale, or manufacture for sale, unless the contrary is proved.

(4) The expression "local authority" in section nine of the Contagious Diseases (Animals) Act, 1886, and in this Act shall include sanitary authorities and county councils, and the Local Government Board may by order determine which of the powers and duties conferred and imposed on local authorities by Milk and Dairies Orders or this Act are to be exercised and performed by sanitary authorities and which by county councils, or may determine as respects any such powers and duties that they shall be performed by the local authorities for the purpose of the Diseases of Animals Acts, 1894 to 1911, and the order may provide for the giving of assistance and information by any one such authority to any other such authority in carrying out such powers and duties, for determining the officers of local authorities by whom the several powers and duties are to be carried out, and for making such adaptations of the provisions of section nine of the Contagious Diseases (Animals) Act, 1886, as may be necessary to make them applicable to any such authorities.

(5) The Scilly Islands shall be deemed to be a county and the council of those Islands the council of a county, and any expenses incurred by that council under this Act or the Milk and Dairies Orders shall be treated as general expenses of the council.

16.—(1) Section fifty-three of the Public Health Acts Amendment Act, 1907 (which confers power to require dairymen to furnish lists of sources of supply), shall apply to London as if it were herein re-enacted with the substitution of references to sanitary authorities and districts of sanitary authorities, for references to local authorities and the districts of local authorities, and any penalties imposed by the said section as so applied shall be recoverable summarily.

(2) Any provisions of the Public Health Act, 1875, applied by this Act shall, for the purposes for which they are so applied, extend to London, subject to necessary adaptations.

(3) Section thirty-four of the Contagious Diseases (Animals) Act, 1878, as amended by section nine of the Contagious Diseases (Animals) Act, 1886, and this Act shall, notwithstanding anything in the Public Health (London) Act, 1891, extend to London.

17.—(1) This Act may be cited as the Milk and Dairies Act, 1914, and shall come into operation on the first day of January, nineteen hundred and fifteen or such later date, not being later than the first day of October, nineteen hundred and fifteen, as the Local Government Board may by order appoint.

(2) This Act shall not extend to Scotland or Ireland.

(3) The enactments specified in the Third Schedule to this Act are hereby repealed to the extent mentioned in the third column of that Schedule, and there shall also be repealed, as from the expiration of one year after the commencement of this Act, so much of any local Act as deals with any of the matters dealt with by any of the provisions of this Act.

SCHEDULES.

First Schedule.

Procedure for Stopping Supply of Milk under Section 3.

(1) The medical officer of health of the county or county borough shall report the matter to the council of the county or county borough (hereinafter referred to as the responsible authority).

(2) His report shall be accompanied by the veterinary or bacteriological reports which have been furnished to him.

(3) On the receipt of the report or a copy of the report from the medical officer of health, the responsible authority may serve on the dairyman notice to appear before them, or furnish an explanation in writing, within such time not less than forty-eight hours from the time of the service of the notice on him as may be specified in the notice, to show cause why such an order as is hereinafter mentioned should not be made.

(4) The notice shall be accompanied by a copy of the reports made in respect of the dairy.

(5) The responsible authority if, in their opinion, the dairyman has failed to show cause why an order should not be made, may make an order prohibiting him, either absolutely or unless such conditions as may be prescribed in the order are complied with, from supplying for human consumption, or using or supplying for use in the manufacture of products for human consumption, any milk from the dairy until the order has been withdrawn in accordance with the provisions of this Schedule.

(6) The order shall specify the grounds on which it is made.

(7) On the making of such an order, a copy of the order shall forthwith be served on the dairyman, and notice of the facts shall also be served on the Local Government Board and the Board of Agriculture and Fisheries.

(8) Where no order is made, the responsible authority shall allow the dairyman any reasonable expenses incurred by him in showing cause why the order should not be made.

(9) An order prohibiting the supply or use of milk made under this Schedule shall forthwith be withdrawn, and notice of withdrawal served on the dairyman as soon as may be after the responsible authority or their medical officer of health is satisfied that the milk supplied from the dairy is not likely to cause disease.

(10) The medical officer of health shall have power to withdraw an order if so authorized by the responsible authority.

(11) If a dairyman is aggrieved by the making or continuance of an order prohibiting the supply or use of milk, he may by complaint under the Summary Jurisdiction Acts appeal to a court of summary jurisdiction.

(12) A court of summary jurisdiction on such appeal may confirm, vary, or withdraw the order and may direct to and by whom the costs of the appeal are to be paid.

(13) Pending the determination of the appeal, an order shall remain in force unless previously withdrawn.

(14) If an order prohibiting the supply or use of milk is made under this Schedule without due cause, or if a responsible authority or medical officer of health unreasonably neglect or refuse to withdraw any such order, any dairyman, if not himself in default, shall be entitled to recover from the responsible authority full compensation for any damage or loss which he may have sustained by reason of the making of the order or of the neglect or refusal to withdraw the order.

(15) In the case of an appeal under this Schedule being allowed, the court to which the appeal is made shall determine and state whether the order, the subject of appeal, has been made without due cause or the withdrawal has been unreasonably neglected or refused, and whether the dairyman has been in default.

(16) Any dispute as to the fact of damage or loss or as to the amount of compensation shall be settled by arbitration in the same manner as provided by the Public Health Act, 1875, and any sum awarded as compensation shall be recoverable as a civil debt.

(17) If the compensation claimed does not exceed twenty pounds it may at the option of either party instead of being settled as hereinbefore provided be settled by and recoverable before a court of summary jurisdiction.

SECOND SCHEDULE.

Amendment of Sale of Food and Drugs Acts.

(1) Where, under the Sale of Food and Drugs Acts, 1875 to 1907, a sample of milk is procured from a purveyor of milk, he shall, on being required to do so by the person by whom or on whose behalf the sample was taken, state the name and address of the seller or consignor from whom he received the milk.

(2) The local authority in whose district the sample was taken may take or cause to be taken in accordance with the provisions of the Sale of Food and Drugs Acts, 1875 to 1907, relating to the procuring of samples, at the place of delivery, of milk in course of delivery, one or more samples of milk in course of transit or delivery from the seller or consignor.

Notice of intention to take proceedings under the Sale of Food and Drugs Acts, 1875 to 1907, against the purveyor shall be served upon him within four days after the sample of milk was procured from him, and the purveyor may within twenty-four hours of the service of such notice serve on the local authority a notice requiring them to procure a sample of milk from the seller or consignor in the course of transit or delivery to the purveyor, unless a sample has been so taken since the sample was procured from the purveyor; and where the purveyor has not served such notice as aforesaid, he shall not be entitled to plead warranty as a defence in any such proceedings:

Provided that the purveyor shall not have any such right to require that such a sample shall be taken in cases where the milk from which the sample procured from the purveyor was taken was a mixture of milk obtained by the purveyor from more than one seller or consignor.

(3) Any sample of milk so taken in the course of transit or delivery shall be submitted for analysis to the analyst to whom the sample procured from the purveyor is or was submitted.

(4) If proceedings are taken against the purveyor of milk, a copy of the certificate of the result of the analysis of every sample so taken in the course of transit or delivery shall be furnished to the purveyor, and every such certificate shall, subject to the provisions of section twenty-one of the Sale of Food and Drugs Act, 1875, be sufficient evidence of the facts stated therein, and shall be admissible as evidence on any question whether the milk sold by the purveyor was sold in the same state as he purchased it.

(5) The local authority of the district in which the first-mentioned sample was taken may, instead of, or in addition to taking proceedings against the purveyor of milk, take proceedings against the seller or consignor.

(6) In any case in which it is proposed to take proceedings under the Sale of Food and Drugs Acts, 1875 to 1907, against the owner of cows in respect of a sample of milk of such cows taken in course of transit or delivery, notice of the intention to take such proceedings shall be served upon the owner within four days after the sample is taken, and the owner may within twenty-four hours of the service of such notice serve on the local authority a notice requiring them to procure a sample of milk from

the corresponding milking from the dairy in which the cows are kept, and the foregoing provisions shall apply to such sample :

Provided that the person taking the sample of milk from the dairy shall be empowered to take such steps at the dairy as may be necessary to satisfy him that the sample obtained from the dairy is a fair sample of the milk which the dairy herd at that dairy yields when properly and fully milked.

ANNUAL REPORT OF THE BROWN ANIMAL SANATORY INSTITUTION COMMITTEE.

THE Annual Report of the Superintendent of the Brown Animal Sanatory Institution for 1913 has been presented by the Committee of Management. From this it appears that during the year the total number of examinations of animals made was 7,036, and the total number of animals brought to the Institution was 6,022, of which 565 were in-patients at the Hospital. Animals under treatment included 3,956 dogs, 1,355 cats and 535 horses, the commonest diseases being distemper, mange and scabies in dogs and lameness in horses. It was estimated that 400 animals were sent away to veterinary surgeons, treatment being refused on the grounds that the owners could afford to pay the proper fees. Of the 565 in-patients, 520 were cured or relieved, 17 died, and 28 were destroyed as incurable.

The five Lectures required under the will of the late Mr. Brown were delivered during December by the Superintendent, Mr. F. W. Twort, M.R.C.S., L.R.C.P., in the Theatre of the Royal College of Surgeons. The subject of the Lectures was "The Cultivation of Animal and Vegetable Micro-organisms."

Many bacteriological and pathological examinations have been made in the laboratories on materials obtained from the Hospital during the year.

The following investigations have also been carried out in the laboratories by different workers :—

Mr. W. Edmunds : (1) The functions of the thyroid and parathyroid glands.

Prof. T. Hewlett and Dr. J. A. Shaw-Mackenzie : (2) Serum tests for malignant growths.

Dr. C. C. Twort (Beit Memorial Fellow) : (3) Production of Johne's disease in rodents ; (4) *Coccidium oviforme* and *Coccidium bovis ;* (5) The rapidity with which lymphatic glands become infected ; (6) Immunity in tubercular disease.

The Superintendent : (7) The cultivation of the *lepra bacillus.*

Mr. Ingram and the Superintendent : (8) Johne's disease of cattle.

Dr. E. Mellanby and the Superintendent : (9) Infantile diarrhœa.

Dr. C. C. Twort and the Superintendent : (10) The nature of certain filter-passing micro-organisms.

General Articles.

VACCINE THERAPY IN ROUTINE PRACTICE.

By WM. SCOTT, F.R.C.V.S., F.R.M.S.
Consulting Veterinary Surgeon for the County of Somerset.

In recording the following cases I have selected them as being more or less typical of the diseased conditions one usually sees in general practice. The diverse nature and characteristics of the cases thus selected indicate the wide range over which vaccine therapy may be applied, and that the reader may form a fair idea of the relative value of the treatment by vaccines I have added at the end of each record my percentage of recoveries.

I.—Infective Wounds.

Including fistula of the poll, withers, sternum, croup, rectum, anus, and accidental injuries.

Subject.—A nine-year-old cart mare, due to foal in four months, showing a deep punctured wound in the right groin. The wound extended to the tunica abdominalis, and as the animal was very fat the depth was very considerable, which, when seen by me, was aggravated by considerable swelling. The injury was supposed to have been caused by the horn of a bull. The wound was comparatively dry and *not discharging*, a very significant omen, as it clearly indicated if the wound was infected by pathogenic bacteria they were having all their own way, inasmuch as the bacteriotropic elements were not pouring through. With due precautions scrapings were taken from the wound for future cultural purposes. Being unprepared first aid treatment of the wound was carried out, irrigation with salt and water, curetting and plugging the cavity with lint soaked in ol. tereb. and salad oil. The mare was feeding but her temperature was 104·2° F. The swelling extended from the wound under the abdomen to the chest.

At the 24th hour the temperature was 105·3° F. The cellular effusion had extended to the fore legs and the animal walked with difficulty.

At the 48th hour the temperature was 105° F., and the swelling about the same, but the wound was discharging a little. A vaccine having been prepared, the causative bacteria being *Bacillus coli*

and *Streptococci*; the chains of the latter were very short—*Streptococcus brevis*—in fact many appeared as diplococci. *Dose.*—*B. coli*, 500,000,000; streptococci, 350,000,000.

At the 72nd hour the temperature was 103.4° F. The swelling was slightly smaller, but the wound was now discharging freely a thick "healthy" pus—"*laudable pus*."

At the 96th hour the swelling had receded considerably and was less tense. The temperature registered 102·3° F.

At the 126th hour a further injection of vaccine was administered: *B. coli*, 1,000,000,000; streptococci, 500,000,000. The swelling now was considerably reduced, the patient could walk with freedom. The temperature was 102·1° F.

At the 220th hour another injection was given: *B. coli*, 500,000,000; streptococci, 350,000,000. The wound healed well; it was not sutured, and a drainage tube was inserted. The swelling gradually disappeared and the recovery was complete. The only medicinal treatment consisted of the internal administration of citric acid and occasional doses of ol. tereb. The wound was irrigated with soda cit. and ac. boric.

Number of cases treated by autogenous vaccine, 49; recoveries, 47. One case was infected by the bacillus of malignant œdema and died; one case had recovered from septic arthritis, finally developed *acute* tetanus and died in forty-eight hours.

Causative bacteria:

Staphylococci with *B. coli*, 21 cases;
B. pyocyaneus with staphylococci, 4 cases;
B. coli communis, 4 cases;
B. coli communis with staphylococci, 11 cases;
B. coli with staphylococci, 3 cases;
Staphylococci, 3 cases;
Streptococci, 2 cases;
Bacillus of malignant œdema, 1 case.

II.—Pneumonia.

Subject.—An aged cart mare, had been coughing for three or four days previous to my seeing her. On my first visit typical symptoms of pneumonia were established and a stock *polyvalent* vaccine was administered forthwith. There was slight bilateral nasal discharge and running at the eyes. Temperature, 104·3° F.; respiration 62 per minute, and somewhat laboured; pulse 82; visible membranes

slightly cynotic. Lung puncture was performed and 10 c.c. sterile nutrient broth injected into the parenchyma and a serosanguineous material aspirated. From this, nutrient tubes were inoculated and incubated and long chained streptococci (*S. longus*) and diplococci isolated.

At the 38th hour an autogenous dose was injected : Streptococci, 250,000,000 ; diplococci, 250,000,000.

At the 64th hour the temperature was 104·1° F. ; respiration 58 per minute ; pulse 97.

At the 86th hour the mare had eaten some green food and looked brighter. Pulse 82 ; respiration 47 ; temperature 103° F.

At the 116th hour, pulse 80 ; respiration 43 ; temperature 103·1° F. A further injection was given : Streptococci, 450,000,000 ; diplococci, 450,000,000.

At the 140th hour considerable general improvement was noticed. Pulse 71 ; respiration 35 ; temperature 102·4° F.

At the 163rd hour the patient had lain down and rested about two hours. Pulse 62 ; respiration 30 : temperature 101·4° F.

At the 215th hour patient much better, both focal and general. Pulse 60 ; respiration 27 ; temperature 102° F. Another lung puncture was performed and cultures duly made on agar and blood agar and several colonies examined. No diplococci were detected, only streptococcal chains, but it is interesting to note the cocci were somewhat flattened, stained irregularly and appeared smaller altogether. A final injection of 750,000,000 streptococci was given. Progress was quite satisfactory, the animal was turned out to grass for a month, after which she was put to work.

Number of cases treated by autogenous vaccine, 14 ; recoveries, 12. One case developed gangrene (pulmonary) and died ; one case had hydrothorax complications and died.

Causative bacteria :

Cocci bacillus with streptococci, 5 cases ;
Cocci bacillus, streptococci and diplococci, 2 cases ;
Diplococci with cocci bacillus, 2 cases ;
Streptococci and staphylococci, 1 case ;
Streptococci and diplococci, 4 cases.

III.—Bronchitis.

Subject.—An aged vanner, subject to slight "*broken wind*" of long standing. Had an influenzal cold for some days which had gone through the whole stable. The cough was very "croupy ; charac-

teristic respiratory crepitus and wheezing could be detected, and a copious nasal discharge. Pulse 64 ; respiration 42 ; temperature 104·1° F. Lung puncture was practised. The bacteria identified were *Streptococcus longus*, *Staphylococcus albus* and a coccus (Gram negative) apparently of the "*Micrococcus catarrhalis*" group.

At the 36th hour a vaccine was administered : Streptococci, 250,000,000 ; staphylococci, 500,000,000 ; *M. catarrhalis*, 300,000,000. A scarcely perceptible reaction followed.

At the 60th hour the following was given : Streptococci, 500,000,000 ; staphylococci, 750,000,000 ; *M. catarrhalis*, 500,000,000,

At the 86th hour the patient had a most distressing cough ; copious discharge from both nostrils. Pulse 59 ; respiration 38 ; temperature 104° F.

At the 110th hour cough not so persistent. Respiratory murmurs more normal. Pulse 60 ; respiration 29 ; temperature 102° F.

At the 112th hour patient about the same ; focal and general.

At the 130th hour condition stationary.

At the 150th hour about the same. Gave : Streptococci, 750,000,000 ; staphylococci, 1,000,000,000 ; *M. catarrhalis*, 750,000,000.

At the 180th hour pulse 53 ; respiration 22 ; temperature 101·4° F. Lungs clearing very well. Patient bright and feeding. Bowels somewhat constipated. Order, 1 pint linseed oil and 10 ozs. medicinal paraffin.

At the 220th hour progress very satisfactory.

At the 275th hour no nasal discharge, very little cough, appetite good. Pulse, respiration and temperature about normal. Gave : Streptococci, 300,000,000 ; staphylococci, 300,000,000 ; *M. catarrhalis*, 250,000,000. No further treatment was adopted and the patient was discharged three days later.

It is interesting to note the emphysematous symptoms have nearly disappeared, but, of course, I cannot go further than say this salutary condition MAY be due to the vaccine course. I may, however, add I am at present treating two cases of broken wind with vaccines, having grown bacteria from material taken from their lungs. These I will report upon later.

Number of cases treated by autogenous vaccine, 6 ; recoveries, 6.

Causative bacteria : Streptococci, staphylococci, *M. catarrhalis*, 3 cases ; Cocci bacillus (Pasteurella) with staphylococci, 1 case ; Cocci bacillus (Pasteurella) with streptococci with *M. catarrhalis*, 2 cases.

IV.—Subacute Nephritis.

Subject.—An aged hunter mare, seen in consultation with Mr. Langford, M.R.C.V.S., of Shaftesbury, which was first noticed going stiffly after a good run with the Blackmore Vale Foxhounds. The description of the symptoms as given by the owner and his attendants were so conflicting and confusing as to offer little assistance to the expert. When seen by us, however, the symptoms clearly suggested kidney affection. A sample of urine was procured with the usual precautions, and microscopical examination after centrifugalizing revealed numerous crystals, a few red blood cells, epithelial cells and actively motile bacilli. On testing the urine faint traces of albumin could be detected and the reaction was strongly acid. Agar tubes inoculated produced well-developed colonies which proved to be those of *B. coli*. A vaccine was made and five ampoules despatched to Mr. Langford, who kindly undertook the administration of them, the first dose being composed of 500,000,000 *B. coli*, each successive dose increasing a quarter of a million. The injections were given every five or six days. Six weeks later Mr. Langford sent the following report: "The mare is much better and save for a slight crossing of the legs appears all right." A sample of urine was received at this date which was normal, except for an excess of crystals. There were no cells and no bacteria detected. I may mention the first sample of urine sent was very cloudy in appearance, thick in consistence, in fact looked like rancid oil.

Number of cases treated by autogenous vaccine, 9; recoveries, 8.

Causative bacteria:

B. coli communis, 4 cases;
B. coli with streptococci, 3 cases;
B. coli and *B. pseudo-diphtheriæ*, 1 case;
*Streptococcus and staphylococcus, 1 case.

V.—Chronic Cystitis.

Subject.—A six-year-old mare, which was recently purchased by a client and shortly after which he found was suffering from the continual discharge of urine (incontinence). When seen by me the urine was dribbling away at intervals down the perineum and both hind legs with consequent excoriation of the parts. The urine gave a strongly acid reaction and contained a great profusion of epithelial cells. By using a vaginal speculum and dilating the meatus urinarius with a pair of long forceps to permit the entrance of a small electric

* This case was diagnosed as pyelo-nephritis and proved fatal.

torch I was enabled to observe the state of the cystic mucosæ. The membranes presented an irregular corrugated appearance and were of a dirty reddish-grey colour. At intervals capillary blood-vessels stood out somewhat prominently. The capacity of the organ was much diminished ; in fact, the mucous surface was so shrunken as to prevent any distension of the organ at all. A sample of urine was removed under sterile precautions, *i.e.*, the insertion of a vaginal speculum previously boiled, painting the meatus with tincture of iodine and re-painting, after which a long sterile metal cannula was passed into the bladder, while the other end of the cannula reached into a sterile test tube. About 1 c.c. each of this fluid was poured into an agar, blood agar and gelatine tube and allowed to flow freely all over the surface of the media, taking care, of course, it did not come in touch with the cotton plug. These tubes were then incubated in the *upright position*, the first two at 37° C., the last at room temperature. Pure cultures developed, which eventually proved to be streptococcal colonies. The coccus belonged to the *longus* group apparently. It may also be interesting to note the cocci appeared to possess very slight adhesive affinity in chains. Excessive mixing of the colonies collected on a platinum loop with the globule of water placed upon the slide broke up these chains with evident ease and the slightest shaking of the bacterial emulsion in the sealed test tube prior to standardization effectually produced a field of single cocci for the bacterial count. In the case of the strangles streptococcus the converse to this is the rule. Six ampoules were supplied, the first dose containing 500,000,000 streptococci ; the second dose, 750,000,000 ; the third dose, 1,000,000,000 ; the fourth dose, 1,250,000,000 ; the fifth dose, 1,000,000,000 ; the sixth dose, 500,000,000. The interval between each dose varied from five to seven days. In two months dated from from the time of the first injection, the net results were as follows : The patient had considerably improved in condition, the incontinence of urine had greatly diminished, but there were still occasional irregular emissions, not sufficient, however, to cause cutaneous excoriations, and the ordinary observer noticed nothing amiss when micturating. A careful examination of the urine, as well as biological testing, forced me to conclude streptococci were no longer present. The bladder itself, however, appeared to still possess a limited capacity, although the mucosæ were not quite so corrugated. The sphincter of the meatus was still very relaxed and I fear always will be. Later I propose stretching the walls of the

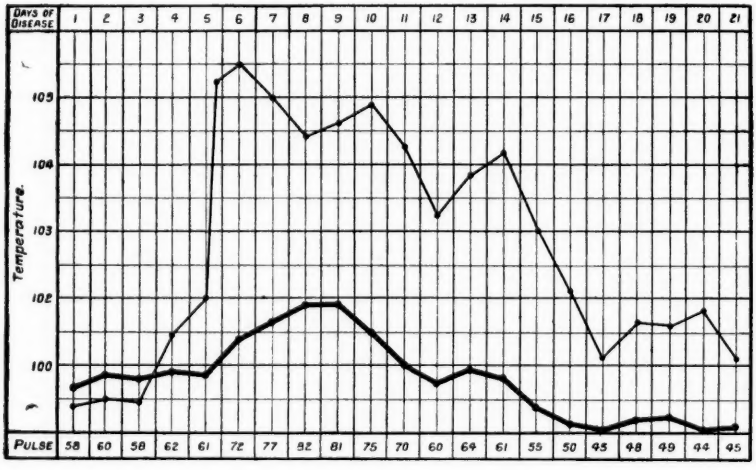
viscus to increase its capacity so that less continual pressure may be exerted upon the sphincter itself.

Number of cases treated by autogenous vaccines, 2 ; one cured, one much improved.

Causative bacteria : Streptococcus, 1 case ; *B. coli* with streptococcus, 1 case.

VI.—Strangles of the Irregular Type.

Subject.—Cart gelding (aged) in a stable where strangles had affected the occupants for some weeks. A sub-maxillary abscess formed. This was followed by a postpharyngeal abscess, œdema of



Temperature and pulse chart.

the lips, nose, chest, abdomen and hind legs, simulating purpura hæmorrhagica, but membranous petechiæ were not visible and later poll evil developed from which cultures of pure streptococci were obtained. When first seen the case was treated on ordinary orthodox lines, fomentation, lancing abscess, irrigating cavity and simple medicinal remedies.

At the 120th hour a stock vaccine of : Streptococci, 500,000,000 ; staphylococci, 750,000,000.

At the 192nd hour an autogenous dose was injected : Streptococci, 500,000,000.

At the 288th hour : Streptococci, 700,000,000.

At the 408th hour : Streptococci, 500,000,000.

This case being a very typical one of "irregular" strangles I give an epitome here, the full report appearing in the *Veterinary News* of May 2, 1914.

The special interest in this case appears to me to be the fact it started with a pure streptococcal invasion and ended as such. I may also draw attention to the fact that there was less pronounced sub-cellular infiltration, which I believe the vaccines were the means of preventing the merging into an organized purpura hæmorrhagica.

Number of cases treated by autogenous vaccine, 7 ; recoveries, 5.

Causative bacteria : Streptococci with staphylococci, 5 cases ; streptococci, 1 case ; streptococci, *B. coli* with staphylococci, 1 case.

One case developed empyæma and died. One case developed mesenteric abscess and died.

VII.—Ulcerative Keratitis.

Subject.—A Great Dane, weighing 138 lb., age 2½ years, and reported never to have had distemper. When first seen the left eye was greatly inflamed, the eyelid almost persistently closed and a slight muco-purulent discharge was present. The right eye was a trifle dull. The exact pathological conditions at this stage were acute conjunctivitis, diffused keratitis and a spreading corneal ulcer situated away from the direct line of vision and near the outer canthus. The cornea was exceedingly cloudy throughout and radiating from the ulcer stood out in bold relief prominently gorged blood-vessels. This eye was functionless. The usual treatment was adopted, bathing with weak boric water and dropping a collyrium of atropin with zinc sulph. into the eye at intervals. I may add a leech was also applied at the outset. The patient was kept in the dark throughout.

Note.—I have no definite record of strangles running a regular course where vaccine therapy was practised, but they must be well over thirty and possess no special interest.—W. S.

A week of this treatment gave no benefit ; in fact, the eye appeared on the whole worse. For the next week we irrigated the eye with iodine water (weak) and used ophthalmic discs and insufflation of hydrargyrum subchlor. instead of lotion. This also failed to give any relief. The ulcer had spread a little more, but the cornea was perhaps slightly less opaque. I now began to fear the loss of the eyesight and conveyed my views to the owner, with the result

the patient was despatched to my surgery. The eye was irrigated with sterile iodine water and bound up with boric lint swabs to remove the risk of alien bacterial contamination. This was repeated three times on the day of admission and on the evening of the same day a sterile platinum loop was drawn firmly along the surface of the ulcer and nutrient tubes inoculated. In due course colonies formed. These proved to be pure *Staphylococcus albus.* A vaccine from this bacterium was made forthwith and a dose of 250,000,000 staphylococci administered. The negative phase was very slight, although there was considerable increase in the focal discharge. Local treatment from this date consisted of cold water irrigation from a hose-pipe for fifteen minutes three times a day—the procedure being a fair amount of water force was driven between the eyelids for four or five minutes, an interval of rest allowed of one to two minutes, the irrigation repeated and the same process gone over again. In this manner I believe greater benefit can be derived than from a continual low temperature of fifteen or twenty minutes. The therapeutics of cold water application as it appears to me is, first, as a vaso-constrictor and consequent upon the low temperature, a bacterial depressor. Removal of the cold water causes an increased flow of blood to the parts, so that the reaction is, second, as a vaso-dilator. Cause these two functions to be brought into play one after the other and a better local tone must be restored with the consequent increase of the bacteriotropic elements directed to the diseased parts. To further supplement the determination of Nature's fighting antibodies to the diseased parts after each irrigation I applied a piece of rubber tubing round the neck of the patient to act as a tourniquet. This was sufficiently tight just to make the animal resent it and was kept up for five or ten minutes at a time, thereby also determining a much desired hyperæmia.

On the 7th day, dated from the first injection, the eye certainly presented a more healthy appearance. The ulcer was, if anything, slightly smaller, the corneal vessels not so prominent, and the discharge somewhat less. A further injection of 500,000,000 staphylococci was now given.

On the 16th day there was a considerable improvement. The ulcer had shrunk considerably, there was only a slight discharge each morning to remove, and the cornea was clearing.

On the 26th day marked improvement was recorded. The ulcer had diminished to a mere speak not much larger than a pin-head and

the cornea was clearing rapidly. A further injection of 750,000,000 staphylococci was given.

On the 34th day the patient was discharged, the only remaining condition being a small radiating cicatrix at the seat of the ulcer. This, of course, in time will disappear—as, in fact, at the time of writing it has.

Number of cases treated by autogenous vaccine, 2 ; recoveries, 2.

Causative bacteria : Staphylococci, 1 case ; streptococci with staphylococci, 1 case.

My experience of vaccine therapy in ophthalmic cases is limited to two, but I believe this branch of therapeutics offers great scope in those conditions of the eye having a bacterial origin. The structures of the eye and its appendages liable to bacterial attacks are very delicate. For the destruction of bacteria we are compelled to use antiseptics, but we must ever be on our guard to use them in such stages of dilution that there is no danger of injuring the delicate eye structures. If they are too strong a double drawback occurs—first, injury from without to the parts which we ought to endeavour to preserve, and, second, we diminish the transfusion of immune bodies from within which we ought to encourage. Where the latter is lacking vaccine therapy supplies the stimulus. To sum up: antiseptics in bacterial invasions of the eye are useless. They may be dangerous and we must therefore fall back upon such means as we possess to destroy the bacteria by facilitating the free access of immune bodies to the bacterial foci.

TRYPANOSOME DISEASES OF DOMESTIC ANIMALS IN NYASALAND.*

I.—*Trypanosoma simiæ*, sp. nov. Part III.

By Surgeon-General Sir DAVID BRUCE, C.B., F.R.S., Majors DAVID HARVEY and A. E. HAMERTON, D.S.O.,
Royal Army Medical Corps.
AND
Lady BRUCE, R.R.C.

Introduction.

In previous papers† the morphology of *Trypanosoma simiæ* and its action on animals have been described. In this it is intended to give an account of its development in *Glossina morsitans.*

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* Reprinted by permission from the *Proceedings of the Royal Society*, 1913, B, vol. lxxxvii.

† *Proc. Roy. Soc.*, 1912, B, vol. lxxxv, and 1913, B, vol. lxxxvi.

Before entering, however, into the details of this particular development, it may be of interest to take a general survey of the various modes of development which take place in the different groups of trypanosomes. It may then be laid down that there is a well-marked separate and characteristic mode of development in each of the three main groups of trypanosomes :—

In the first group—the *T. brucei* group—which includes *T. brucei*, *T. gambiense*, *T. evansi* (?), and *T. equiperdum* (?), the parasites develop —at least in the two first named species—at first through the whole length of the intestinal tract, excluding the proboscis, and eventually reach the salivary glands, where forms resembling those found in the blood of animals are developed, and these alone constitute the infective stage.

In the second group—the *T. pecorum* group—which includes *T. pecorum* and *T. simiæ*, the development takes place in the intestinal tract, including the labial cavity of the proboscis, and afterwards the trypanosomes reach the hypopharynx, or termination of the salivary duct in the proboscis. Here they revert to the original blood form and become infective. In this group trypanosomes are never found in the salivary glands, and no blood forms, or infective forms, are developed until the hypopharynx is reached.

In the third group—the *T. vivax* group—which includes *T. vivax*, *T. uniforme* and *T. capræ*, the initial stages of the development take place in the labial cavity of the proboscis alone ; later the hypopharynx is invaded, where again blood forms are developed, which again constitute the only infective forms. Here also there is no invasion of the salivary glands, and, in addition, no development takes place in the intestinal canal.

In all three groups the common factor which leads to the formation or development of the final or infective forms is the invasion of the salivary tract, and this is accompanied by a reversion to the original blood forms.

Definitions.

In this paper the word "proboscis" will mean the piercing apparatus of the "fly," made up of the labrum, labium, labellum and hypopharynx. There are two tubes in the proboscis : one for the passage inwards of blood, made up by the coalition of the labrum and labium, the other for the passage outwards of the salivary secretion—the terminal salivary duct or hypopharynx. The

term "labial cavity" in this paper will mean the former, or tube for conveyance of blood, the word "hypopharynx" the latter, or duct for conveyance of saliva. In the past the use of the word "proboscis," including both tubes, has given rise to a good deal of ambiguity.

The definition of the words "infected" and "infective" were given in a previous paper.*

The term "blood form" means a stage in the development of the trypanosomes in the "fly," when there is a reversion to the original form found in the blood of animals, and from which the cycle of development originated.

The Development of T. simiæ in G. morsitans.

Eight experiments were carried out with laboratory-bred flies. Two were positive and six were negative. The following table shows these eight experiments, the number of flies used, the number of infected flies found on dissection and the number of days which elapsed before the flies became infective :—

TABLE I.

Date	Experiment	Number of flies used	Experiment positive or negative	Number of infected flies found	Number of days before flies became infective
1912					
May 1 ...	502	20	−	...	...
June 27 ...	754	31	+	2	50
Oct. 9 ...	1477	17	−	1	...
Nov. 11 ...	1582	8	−	...	...
,, 15 ...	1602	20	−	...	..
,, 21 ...	1622	16	−	...	...
1913					
Feb. 5 ...	1847	45	+	7	20 ?
,, 10 ...	1856	16	−	...	...

It will be noted that there is a great difference between the two positive experiments as regards the time required for the flies to become infective. In the first fifty days elapsed, in the second only twenty. This is due to different temperatures under which the experiments were carried out. The first positive experiment was done during the coldest time of the year on Kasu Hill, when the mean temperature was 62° F. (16·6° C.), which is much lower than on the plains, the natural habitat of *G. morsitans*. The flies in the

* *Proc. Roy. Soc.*, B, vol. lxxxvi ("Infectivity of *Glossina morsitans* in Nyasaland").

other experiment were kept in an incubator at a temperature of 83° F. (28·3° C.), and they became infective much sooner.

Details of the Two Positive Experiments.

The following table gives the principal details of the first positive experiment :—

Experiment 754.

TABLE II.

Day of experiment	Procedure	Remarks
1—3	Flies fed on *T. simiæ*-infected monkey.	Trypanosomes first appeared on the fifty-seventh day.
4	Starved.	
5—60	Fed on clean monkey.	

It is seen that it was not until the flies had been fed on the clean monkey for fifty-seven days that the animal showed trypanosomes in its blood. If we allow seven days for the average incubation period of the parasite in the mammalian host, then the monkey contracted the disease about the fiftieth day after the infecting fly had fed on trypanosome-infected blood.

The following table gives the principal details of the second positive experiment :—

Experiment 1847.

TABLE III.

Day of experiment	Procedure	Remarks
1—10	Flies fed on *T. simiæ*-infected monkey.	Flies became infective on the twenty-sixth day after first infected feed ; sixteen days after the last.
11	Starved.	
12—27	Fed on clean monkey.	

Since the flies of this experiment were fed on infected blood for a period of ten days, the time required for the trypanosomes taken up by the "fly" to multiply and regain their virulence cannot be accurately estimated. Allowing seven days for the incubation period it cannot be more than twenty days.

When the healthy monkey became infected, in order to separate the infective flies, those remaining alive were divided into three batches. Each batch was put into a cage and fed separately on a healthy monkey. The following table gives the details and results of feeding the three batches of flies :—

TABLE IV.

Experiment	Batch	Number of flies	Number of days fed	Result	Number of infected flies found
1847	1	12	7	−	0
1847	2	10	7	+	3
1847	3	13	7	+	3

The monkeys on which Batches 2 and 3 were fed showed trypanosomes in their blood on the sixth day after the first application of the flies. It is therefore highly probable that the flies infected the monkeys on the first day of feeding.

Details of the Six Negative Experiments.

The following table shows the method of procedure in carrying out the six negative experiments :—

TABLE V.

Experiment	Day of experiment	Procedure	Remarks
502	1—2	Fed on infected monkey.	All flies negative on dissection.
	3—4	Starved.	
	5—42	Fed on clean monkey.	
1477	1—3	Fed on infected goat.	One infected fly found on the fortieth day ; proboscis and gut infected.
	4—5	Starved.	
	6—45	Fed on clean monkey.	
1582	1st	Fed on infected pig.	All flies negative on dissection.
	2nd	Starved.	
	3—30	Fed on clean monkey.	
1602	1st	Fed on infected pig.	All flies negative on dissection.
	2nd	Starved.	
	3—35	Fed on clean monkey.	
1622	1st	Fed on infected pig.	All flies negative on dissection.
	2nd	Starved.	
	3—29	Fed on clean monkey.	
1856	1—7	Fed on infected monkey.	All flies negative on dissection.
	8—26	Fed on clean monkey.	

In Experiment 1477 a portion of the intestine of the infected fly was inoculated subcutaneously into a pig ; the pig did not become infected.

Out of a total of 173 flies used in these experiments, ten flies (5·8 per cent.) became infected with a growth of trypanosomes in the intestines and in the probosces. It will also be seen that only

one fly in thirty-one (2·7 per cent.) became infected when the flies were kept at ordinary room temperature, whereas four became infected in forty-five (9 per cent.) when the flies were kept at a temperature of 28° C.

General Considerations regarding the Development of T. simiæ in G. morsitans.

All the flies dying during the progress of the experiments were dissected. In the two positive experiments, out of seventy-six flies dissected, nine infected flies were found. The following table gives the results of the dissection of these nine flies:—

TABLE VI.

Experiment	Time, days	Proboscis		Proventriculus	Crop	Foregut	Midgut	Hindgut	Proctodæum	Salivary glands
		Labial cavity	Hypopharynx							
754	37	+ +	...	+ +	−	+ +	+ +	−	−	−
754	50	+ +	...	+ +	−	+ +	+ +	−	−	−
1847	16-26	−	−	−	−	+ +	+ +	−	−	−
1847	30-40	+	+	−	−	+ +	+ +	−	−	−
1847	31-41	+ +	+	+ +	−	+ +	+ +	+ +	−	−
1847	31-41	+ +	−	+	−	+ +	+ +	+ +	−	−
1847	31-41	+ +	+	+	...	+ +	+ +	...	...	...
1847	32-42	+ +	+	+	−	+ +	+ +	+ +	−	−
1847	32-42	−	−	+	−	+ +	+ +	−	−	−

From this table it will be seen that in seven out of nine flies dissected the labial cavity is found to contain trypanosomes. This is very different from what is seen in the similar table relating to *T. gambiense*. There not a single case of infection of the proboscis is recorded.*

At what stage in the development of the trypanosome the proboscis takes a part is not known. It is probable that the infection commences in the intestinal tract and moves forward into the proboscis, but owing to the difficulty of obtaining sufficient laboratory-bred *G. morsitans* the Commission have not, up to the present, enough evidence to establish this detail

In the two infected flies found in the cage of flies, Experiment 754, it is to be regretted that the contents of the hypopharynx were not noted, but in all the infected flies found in Experiment 1847 this was done, with the result that the hypo-

* *Proc. Roy. Soc.*, 1911, B, vol. lxxxiii, p. 516.

pharynx was found invaded by trypanosomes in four out of the seven.

Plate VI represents, at a magnification of 500 diameters, the labial cavity and hypopharynx of an infected fly. While the labial cavity contains clusters of large ribbon-like trypanosomes, the hypopharynx is swarming with small active forms resembling the original blood forms, from which the developmental cycle arose. When the plate is examined, the facility with which a tsetse-fly can infect an animal will no longer be a matter of wonder.

Finally, from the table it will be seen that in no case were the salivary glands invaded.

The Methods used in the Examination of the Flies.

The flies were dissected as described in a previous paper.* An additional method of examining the contents of the hypopharynx was to isolate infective flies by putting each fly into a separate tube, numbering it, and feeding the fly on a susceptible animal with a corresponding number on its cage. The numbers on the cages of animals which became infected indicated the tubes containing infective flies. These, when thus identified, were starved for twenty-four hours, in order to make them hungry. A tube containing one of the infective flies was then taken, and its mouth being covered with mosquito netting was applied to a large cover-glass placed on a man's finger. The hungry fly at once attempted to feed through the glass, and in poking about with its proboscis smeared the surface of the cover-glass with saliva. This was immediately fixed, stained with Giemsa, and examined.

The Trypanosomes found in the Proboscis.

Reference to the table above will show that in Experiment 754 two infected flies were found, one on the thirty-seventh day after feeding on an infected monkey, and one on the fiftieth day, and that the labial cavities of both flies were infected.

The fly that died on the fiftieth day was the one which no doubt actually infected the healthy monkey, since the animal showed trypanosomes seven days after the death of this fly, and no other infected fly was found. As these two flies died before they were isolated, the method of inducing them to salivate on a cover-glass was not used. When, however, the two probosces were examined

* *Proc. Roy. Soc.*, 1911, B, vol. lxxxiii, p. 513.

in a drop of normal saline solution under a cover-glass, trypanosomes attached to the labrum were seen growing in colonies in the labial cavity. They were moving freely, and some detached individuals were swimming actively up and down the lumen of the tube.

It is to be regretted that the contents of the hypopharynx were not specially noted. These were two of the earliest experiments, and at that time the contents of the labial cavity and the hypopharynx were not differentiated.

In Experiment 1847 seven infected flies were found. It will be observed (Table VI) that the first was dissected on the sixteenth day after the last infected feed, and that the proboscis was not infected. Another fly dissected on the thirty-second day had also no infection of the proboscis. A third fly dissected on the thirty-first day had the labial cavity of the proboscis infected, but not the hypopharynx. The remaining four were found to contain swarms of trypanosomes in both the labial cavity and the hypopharynx. On examination it was observed that there were two distinct varieties. The one found in the hypopharynx closely resembled small blood forms of *T. simiæ*. They swarmed in the narrow tube, which had the appearance of being blocked up by their enormous numbers. These small blood forms of the parasite were readily distinguishable from those growing in the labial cavity. Those growing in the labial cavity resemble *Leptomonas*, and are peculiar in having their non-flagellated extremity prolonged to a snout-like extension. They are assembled in clusters and attached by their flagella to the inner surface of the labrum, their prolonged free extremity moving vigorously in the lumen of the tube (Plate VI, fig. 1).

The contents of the hypopharynx of a living infective fly isolated from Batch 2 was examined by inducing the fly to salivate on a cover-glass as described above. On examination of the stained preparations typical blood forms of *T. simiæ* were seen embedded in the saliva which the fly had ejected on the cover-glass in its efforts to reach the skin. Another infective fly was taken alive from its glass tube and its proboscis gently squeezed until a minute drop of fluid was observed at its tip, which was then lightly rubbed over a cover-glass. Here again typical blood forms of *T. simiæ* were found embedded in the salivary secretion.

In Experiment 1847 it is seen that a positive result is associated with the finding of infected flies in which *T. simiæ* resembling those found in the blood of infected animals are found in large numbers blocking up the tube of the hypopharynx.

FIG. 1.

FIG. 2.

PLATE VI.

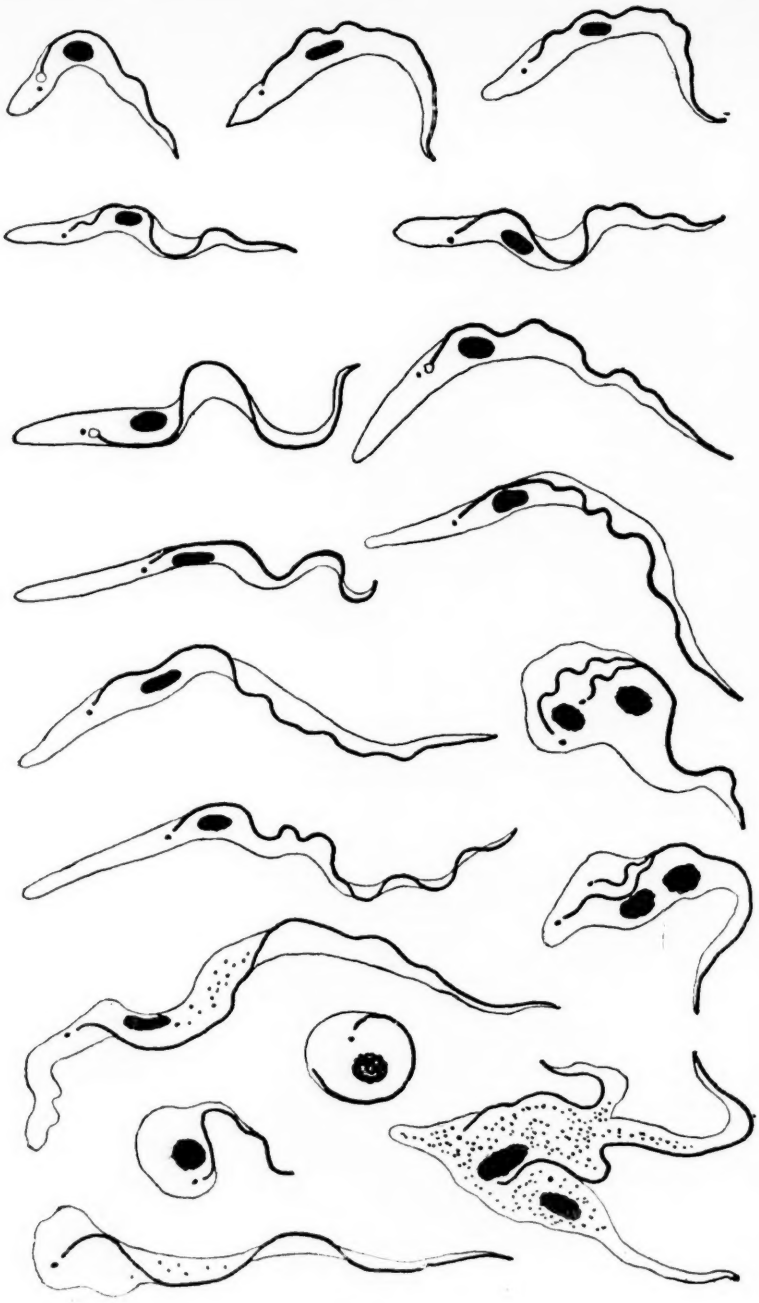

PLATE VII.

The experiment of tempting the infective fly to feed through a cover-glass demonstrates the fact that when the fly salivates, as it undoubtedly does in puncturing the skin, these blood forms of the parasite are washed out of the hypopharynx with the saliva and are injected with it under the skin of the fly's victim.

Further examination of flies, by inducing them to salivate on cover-glasses, revealed the fact that sometimes the long, narrow intestinal forms of trypanosomes are ejected in large numbers on to the cover-glass. There is no doubt, therefore, that an infected fly has the power of regurgitating the contents of its proventriculus and intestines forward into the labial cavity and probably into the blood-stream of the bitten animal. It is conceivable that in this way the proboscis first becomes infected by the intestinal forms of trypanosomes, which attach themselves to the inner surface of the labrum and enter the lumen of the hypopharynx, which they invade, however, only as far as the entrance of the two salivary ducts. Here in the chitinous hypopharynx they establish themselves and, bathed in the salivary secretion, finally complete their development into the infective blood form of the parasite.

It is a curious fact that neither the salivary glands nor even the salivary ducts beyond the hypopharynx have ever been found infected with *T. simiæ*.

It was proved by the Commission in Uganda that the blood forms of *T. gambiense* developing in the salivary tract were the virulent forms of the parasite, and it now seems also proved that the developmental forms of *T. simiæ* found in the hypopharynx represent the last and infective stage of development of this species of trypanosome in the "fly."

It may be noted here that in the negative Experiment 1477, in which an infected fly was found (Table V), the labial cavity was infected with the long forms of the parasite attached to the labrum, but most careful search failed to reveal infection of the hypopharynx with blood forms. In this fly the parasite had not attained the final and essential stage of its development—the reversion to the blood type—and so the fly was harmless.

The Trypanosomes found in the Alimentary Canal.

The intestines of infected flies were generally packed full of trypanosomes from the proventriculus to the mid-gut. Sometimes the infection extended to the hind-gut, but never beyond.

Little need be said in regard to the developmental forms found in the intestines. One curious fact, however, emerges, and that is, that it is impossible to differentiate one species of trypanosome from another by the study of these intestinal forms. Whether it is *T. brucei* or *T. gambiense*, *T. pecorum* or *T. simiæ*, they present the same appearance. Perhaps on further work some differences may become apparent, but at present no difference has been found to exist. The most numerous forms are long, slender, ribbon-like, very active trypanosomes, which in a former paper* were called the normal reproductive type. By comparing Plate VII with the insets of that paper, the resemblance between the intestinal developmental forms of *T. simiæ* and *T. gambiense* will be apparent.

Conclusions.

(1) That *T. simiæ* can be transmitted from infected to healthy animals by the tsetse-fly *G. morsitans*.

(2) That *T. simiæ* multiplies in the intestines and in the labial cavity of the proboscis of the "fly." Here only developmental forms are found, never infective forms.

(3) That the *T. simiæ* growing in the intestines of the "fly" has no specific characters by which it can be distinguished from other species of pathogenic trypanosomes found in tsetse-flies.

(4) That the final stage of the development takes place in the hypopharynx, wherein the infective form of the parasite, similar in shape to the trypanosome found in the blood of infected animals, is produced.

(5) That the flies do not become infective until about twenty days after their first infected feed.

DESCRIPTION OF PLATES.

Plate VI.

Fig. 1.—Appearance of the labial cavity of the proboscis of *Glossina morsitans* with *Trypanosoma simiæ* growing in clusters attached by their flagellar extremities to the inner surface of the labrum. Living and unstained, × 750.

Fig. 2.—Appearance of the hypopharynx in the same fly, showing innumerable small and active *T. simiæ* almost blocking up the lumen of the duct. Living and unstained, × 750.

Plate VII.

Intestinal developmental forms of *T. simiæ*. These do not differ in appearance from the developmental forms of other species of pathogenic trypanosomes found in the intestinal tract of tsetse-flies.

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* *Proc. Roy. Soc.*, 1911, B, vol. lxxxiii, p. 513.

Clinical Articles.

PARALYSIS OF THE RIGHT VOCAL CORD ONLY, IN A ROARER.

By FREDERICK HOBDAY, F.R.C.V.S.
Kensington, W.

The rarity of this condition makes the case worth putting on record, as out of 956 "roarers" in which I have opened the throats and carefully examined the vocal cords this is the only one in which I have ever observed the right cord alone to be paralysed and the left one to move freely. That the left side is paralysed is universally admitted, and occasionally (perhaps in about 2 per cent.), upon opening the throat under chloroform, one finds that neither moves freely, although as the patient regains consciousness the right side will very often commence to move; but for the right one to be paralysed and the left one to move freely must be very rare.

The patient was a bay hunter gelding, 12 years old, with no special details of history other than that it had been purchased by its present owner as a "roarer," with the object of having the ventricle stripping operation performed.

The throat was opened in the usual way and upon inserting the retractor it was observed that the right vocal cord was perfectly still whilst the left one moved quite freely.

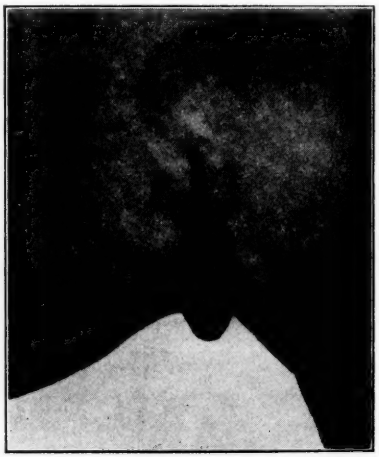
The fact was confirmed by several onlookers, one of whom was a veterinary surgeon, and a prolonged observation was made in order that the horse might be well out of the effects of the chloroform. Ineffectual attempts were made to stimulate the right cord to movement and the only thing necessary to complete the case is, when the time comes, if it can be obtained, a *post-mortem* examination of the muscles of the larynx.

MONORCHID CASTRATION—FLANK METHOD.

By W. CARGILL PATRICK, F.R.C.V.S.
Mullingar.

Having seen my friend Mr. Winter, F.R.C.V.S., Limerick, operating on one of his cases, and liking the method, I decided to put it into practice the first opportunity, which presented itself recently.

The subject was a six-year-old untrained horse; he had been castrated in the usual way on one side as a yearling, I understand, but as the other gland never appeared, he was allowed to remain



untrained, and, as is usual in these cases, his disposition was not of the best; he was sent in for the "rig" operation. On examining *per rectum*, the missing testicle was located about 6 in. in front

of the left inner abdominal ring, and found to be of fair size for a retained gland ; therefore the flank method was adopted, as my experience of removal by the inguinal route has not been wholly satisfactory, descent of bowel having taken place on more than one occasion. The horse was prepared, and a dose of physic administered a few days prior to operation. The site of incision clipped and shaved as shown in accompanying photograph, he was cast with the ordinary hobbles, chloroformed, the usual antiseptic precautions adopted ; then the incision made as suggested by Mr. Winter, blunt dissection being practised on the abdominal muscles. The abdominal tunic was caught up with forceps and a small incision made, same being enlarged by gradually inserting the entire hand, and the gland secured, which in this case was a comparatively simple matter. The cord was abnormally short, still by careful traction it was got just outside the abdominal wound and removed by the H. and D. castrator (which I have found to be a most efficient instrument for the last seven or eight years). Four sutures were inserted in the obliquus externus muscle, and five superficial interrupted ones were put in the skin wound ; there never was the slightest systemic disturbance at any time, and the horse never missed a feed. The accompanying photograph was taken five days after operation, when the swelling was at its maximum : the four buried sutures had been removed, and three of the outer ones.

TUMOUR IN THE ABDOMINAL CAVITY.

By GUY SUTTON, F.R.C.V.S.
Kensington.

THE small extent to which an animal is inconvenienced by the presence of a tumour within the abdominal cavity was lately brought to my notice.

A mare had been regularly employed by a commercial firm for five years as a parcel carter. Early in April it was noticed that she drank a great deal and urinated profusely. She also began to lose flesh, though she was quite good at her work, cheerful, and ate well. There was no rise of temperature or any other symptom to note. At the end of a week she began to "quid" her food, appeared to be hungry and would get food into her mouth, but on attempting to swallow would fail and allow the mash to fall back into the manger.

She has now stopped from work and Mr. Taylor, my colleague, and myself examined her mouth carefully. Nothing was to be noted other than that sharpness of the edges of the molar teeth which was to be expected. This was attended to, and the mare was fed on slops, which she was able to swallow. Wasting now became rapid, and either a tuberculous or cancerous growth was suspected. Rectal exploration yielded no help to the diagnosis, and the mare was tested with tuberculin but failed to act. The temperature never rose beyond 101° F. and the pulse remained good. No medicinal treatment was carried out, and the mare died three weeks after she had been stopped from work, her body being much emaciated, in fact a perfect wreck.

The *post mortem* showed a large tumourous growth, weighing 60 lb., situated between the stomach, liver and spleen.

Mr. Sheather kindly examined a section and reported it to be a "spindle-celled sarcoma."

Was the "quidding" due to nervous irritation from the presence of this growth, making it impossible for the act of swallowing hard food to take place?

FRACTURE OF THE OS PEDIS TREATED ACCORDING TO BIER'S METHOD.

By LEMIRE and DUCROTOY.

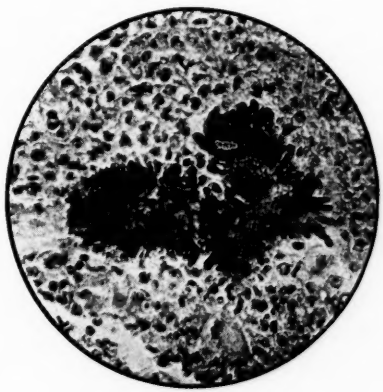
A FIFTEEN-YEAR-OLD mare showed very severe lameness after an accident at riding exercise. The hoof was very warm and sensitive, rotation movement caused marked pain, and no weight could be put on the leg. An injection of cocaine on both sides of the fetlock joint caused the lameness to disappear. After a few days fracture of the os pedis was diagnosed. Treatment was as follows: warm foot baths and putting on of a Bier's bandage on the middle of the metatarsus for ten hours in the day. After about twenty days a groove was made round the hoof under the coronary swelling and the coronet sharply rubbed with embrocation. Two months after every trace of lameness had disappeared. The mare died later on from meningocephalitis. On section the state of the os pedis was examined, and it was found that there had been a triple fracture which had healed by a relief-like callus thrown out. This shows that in a phalangeal fracture use may be made of nutritive and regeneratory venous hyperæmia.—*Revue Vet. Militaire.*

INTERESTING ACTINOMYCOTIC THROAT INFECTION IN A BULLOCK.

By RICHARD JONES, M.R.C.V.S.
Towyn.

On May 28 I was asked to see a bullock with some interference with respiration, evidently due to an obstruction at the back of the throat. Upon examination I discovered a pendulous tumour, about the size of a large orange, on the superior surface of the pharynx and extending into the nasal cavity.

I attempted to remove it with the excisor but could not get the chain satisfactorily over it until I had torn away the posterior portion



with my finger. Once the chain was in position it came away without difficulty.

The specimen was sent to Mr. Basil Buxton, M.R.C.V.S., D.V.S.M., at the Research Laboratories of Messrs. Burroughs Wellcome and Co., and upon microscopical examination he readily demonstrated the cause of the infection to be the ray-fungus, the photomicrograph herewith enclosed showing it beyond question to be present.

It is not, I believe, a usual position in which to find an actinomycotic infection and I thought the case of especial interest on that account.

Canine Clinicals.

A CASE OF STREPTOCOCCAL INFECTION IN A DOG SUCCESSFULLY TREATED BY MEANS OF A VACCINE.

By J. B. NIAS, M.D., M.R.C.P.

(From the Inoculation Department of St. Mary's Hospital, London.)

THE patient in the present case was a dachshund, aged 16, which was brought to me in September, 1911, by Professor Hobday for advice about a chronic suppurating swelling which was situated on the outside of the left hock where the dog had been kicked by a man some time previously. The affected area measured about 2 in. each way, and was raised about the level of the surrounding skin. Pus of a thin and watery character oozed from it on pressure through a number of minute orifices which, no doubt, originally had been hair follicles. As the result, no doubt, of applications and the constant licking on the part of the dog, the hair had all disappeared from the affected region, but the surface of the skin was smooth and healthy. The inflammation evidently was confined to the deeper layers of the skin and the subcutaneous tissue, because the dog was not in any degree lame, and flexion of the joint caused no particular pain.

To one familiar with disease as it occurs in the human subject this boggy area of suppuration suggested at once an infection with streptococci of the kind that are plentiful in mud and street dirt, because wounds and abrasions of the scalp which cannot be perfectly cleansed are often followed by cellulitis of a similar character. Contagious impetigo of the scalp and beard also not infrequently present a similar degree of inflammation from the ramification in the connective tissue spaces of chain-forming micro-organisms. The radical treatment of such a condition, in the shape of multiple incisions followed by poulticing or fomentations,* can hardly be carried out in the case of such an animal as a dog, and therefore I was not surprised to see that such local treatment as had been available had proved comparatively ineffective in the hands of Professor Hobday.

There is a substantial difference, from a clinical point of view, between affections due to staphylococci and those due to streptococci,

* These had been most assiduously tried for five months, as had also applications of iodine, formalin, chinosol, creolin, and other antiseptics; several astringent lotions, powders and ointments. All had failed and the condition of the affected area was steadily getting worse.—FREDERICK HOBDAY.

in that the former cause frank boils or abscesses which come to a head and disperse, while the latter form brawny or indurated swellings which, when acute, are classed as erysipelas, and in a more chronic form are generally summed up as cellulitis. The distinction may not be absolute, but it has a good deal of practical value. The positive chemiotaxis or so-called bacteriotropic action of staphylococci is so great that it causes a copious afflux of leucocytes to the part which not only take up the micro-organisms, but also have a solvent or digestive effect on the tissues which causes the formation of an abscess cavity, which speedily makes its way to the surface through the same solvent process and then evacuates itself so that the process comes to an end. But the toxic effect of streptococci on leucocytes is so much greater that the battle waged between them and the micro-organisms is much more evenly contested, resulting in the condition which is defined as erysipelas, or, if more chronic, as cellulitis. If by art we can intervene in this contest by supplying in some way the deficient chemiolactic or bacteriotropic substances, we may terminate the condition speedily and effectually by an imitation of the natural process.

With a view to intervention of this kind, one's first step was to endeavour to isolate the cause of this curious subacute affection, so as to prepare therefrom what is known as a bacterial vaccine, a term which is somewhat of a misnomer for a remedy applied to a lesion already in existence, but which is sanctioned by authority.

Accordingly, on the occasion of the first visit, the skin of the part having been carefully cleansed, some drops of pus were carefully expressed from the orifices already mentioned, and two agar-tubes were inoculated with the pus and smears were in addition made on several slides for microscopic examination. The cultures proved sterile after twenty-four and forty-eight hours' incubation at blood-heat; and the slides also showed, after appropriate staining, practically no micro-organisms, so much so that I queried whether the lesion might not after all be simply secondary to some undiagnosed injury of bone. However, the history disposed of this suggestion. A day or two later a second attempt was made, and on this occasion the slides showed several zooglœal masses of a Gram-staining diplococcus with a tendency to form chains distributed in the pus; other forms of infective agent like actinomyces or trichophyton were simultaneously excluded. Two inoculated agar-tubes this time gave, along with a colony or two of *Staphylococcus albus*, a scanty

growth of discrete round glassy colonies which proved to be a pure culture of a short-chained streptococcus like that seen in the slides.

The characteristics of streptococci are so indecisive, and the means of distinguishing them specifically so troublesome, that the question of the exact specific characters of the organism isolated in this case may be left over for the present. Suffice it to say that as soon as it was isolated it was tested crucially for being the cause of the infection by being employed for its cure in the shape of a vaccine.

The idea which presides over the employment of such vaccines is that a dead culture of the micro-organism causing a bacterial infection, when injected into the connective tissue of the subject of the infection at a distance from the seat of disease in proper doses, has the power, in a way which we do not perfectly understand at present, of calling forth the production of certain active substances of whose intimate nature again we are still very ignorant, which will stimulate a flagging phagocytosis to such a degree as to bring about the termination of the infective process which is going on on natural lines. That this can be effected is now an admitted fact and the system of treatment resulting is known as therapeutic inoculation. For a description of the whole subject the reader is referred to such works as Wright's "Studies in Immunization," Emery's "Immunity and Specific Therapy," and other text-books of the kind.

From the isolated streptococcus above described, a vaccine was prepared *secundum artem*, in a way which need not be described in detail; and a dose of $\frac{1}{2}$ c.c. of the vaccine representing ten millions of dead streptococci was injected into the flank of the dog by Professor Hobday. This would represent a full dose of streptococcus vaccine for the human adult, and I was rather in the dark as to its effects upon a dog of the size of a dachshund, so that the dog's owner was warned that rigors and other symptoms of a constitutional disturbance might supervene. This, as a matter of fact, did occur to a trifling extent; and in the next case of the kind I should probably begin with a dose of five millions only. In the absence of Professor Hobday I saw the dog again a few days afterwards, and thought that I could already see an improvement in a flattening down of the skin over the distal part of the tumefied area. I bottled three more doses of the vaccine into capsules at the rate of two and a half millions per dose for Professor Hobday to administer

at his discretion, and these were followed by three more at the rate of five millions per dose. The result seems, by Professor Hobday's account, to have been entirely satisfactory, and therefore one hopes, on the principle of the cure showing the disease, that as a matter of fact one did succeed in isolating the real cause of the condition. On the veterinary aspect of the case I leave Professor Hobday to speak.*

To veterinary surgeons who have not yet addressed themselves to the study of this method of treatment, I will merely say that, in my opinion, like doctors, they will have to familiarize themselves with it very thoroughly in the near future, under pain of losing their professional credit.

INTUSSUSCEPTION IN A DOG.

By R. V. PILLAI, G.B.V.C.
Curator, Bengal Veterinary College.

"INVAGINATION," or telescoping one portion of the intestines into another, appears to be quite a common occurrence in young dogs. Owing to the absence of any distinctive symptons it is invariably mistaken for, or at least not easily differentiated from, acute obstruction of the bowels. The condition is the result of violent peristalsis set up by a portion of the intestines due to the presence of irritants, worms, &c., and the subsequent portion not responding to the accelerated movement set on by its component part. A variety of causes are attributed to it and its association with icterus is also seldom disputed.

A terrier pup, a pet of the owner, was brought into our canine clinic to be treated for dysentery. The history of the case was that he had been ailing for two days. The owner reported colicky symptoms had been observed on the previous day and that the appetite had been indifferent for a couple of days. He was otherwise in good health and spirits.

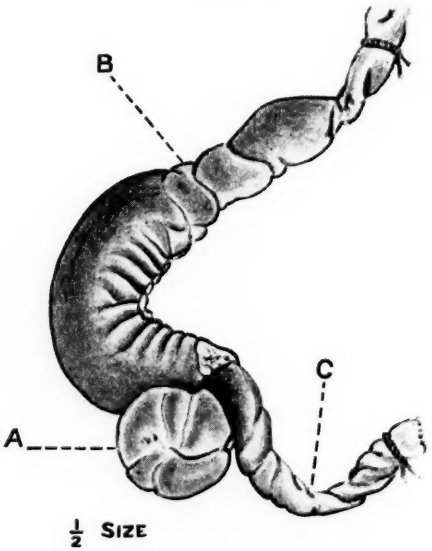
On admission his temperature was 102·2° F., membranes icteric, in fact intensely jaundiced. Manipulation of the abdominal region did not show any abnormality. A microscopical examination of the blood showed negative result. He strained violently to bring out only a few drops of sanguineous mucus and was apparently none the worse for the trouble.

* The case had been, up to the time of the use of the Vaccine, most disheartening. After the third dose there was a distinct and visible improvement and the progress towards a cure was uninterrupted. The dog is still alive (July 1914) and there has been no relapse.—FREDERICK HOBDAY.

A dose of calomel with mag. carb. was prescribed. He did not live long to show more diagnostic symptoms, having succumbed the following day.

Autopsy revealed an old intussusception of the enteric variety; the ileum and the cæcum had invaginated for about 4 in.

To refer to the sketch, the incarcerated ileum extended as far as arrow B, the loop A having been formed at the entrance. The bulging anterior portion was almost treble the normal size and did not yield to pressure, a hard mass of fæcal matter having encircled the portion telescoped, pressing the blood-vessels too tight to admit of any free circulation. The thinner portion C was empty and



Intussusception of the bowel.

shrivelled up and was apparently atrophied, having lost its normal function.

Section of the bulging portion showed also some young spiroptera, not sufficiently numerous to lay hold on, as the initiative cause of the fatal condition.

The case is interesting inasmuch as the condition must have existed for some time without any appreciable constitutional trouble —the invagination must have been at least a month old—also because the end was so abrupt.

TENTH INTERNATIONAL VETERINARY CONGRESS, AUGUST 3 to 8, 1914.

General Meetings.

(1) *Official Opening Meeting*, Monday, August 3, at 11 a.m.
(2) *Foot-and-mouth Disease*, Tuesday, August 4, at 10 a.m.
(3) *Tuberculosis*, Wednesday, August 5, at 10 a.m.
(4) *Epizootic Abortion*, Thursday, August 6, at 10 a.m.
(5) *Public Control of the Production, Distribution and Sale of Milk in the Interests of Public Health*, Friday, August 7, at 9 a.m.
(6) *Disinfection of Wagons*, Friday, August 7, at 12 noon.
(7) *Official Closing Meeting*, Saturday, August 8, at 12 noon.

Sectional Meetings.

Section I.—Veterinary Science in Relation to Public Health.

(*a*) "Meat Poisoning—Its Pathogenesis and the Measures Necessary to Guard Against It," August 4.
(*b*) "General Principles to be Observed in the Inspection of Carcases and Organs of Tuberculous Animals with a View to Determine Their Safety as Articles of Human Food," August 5.
(*c*) "Construction and Interior of Stables in Relation to the Prophylaxis of Diseases of Animals, especially Tuberculosis, and also to the Hygiene of Milk," August 6.

Section II.—Pathology and Bacteriology.

(*a*) "Johne's Disease," August 4.
(*b*) "Bovine Piroplasmoses" (European), August 5.
(*c*) "Ultra-visible Viruses," August 6.
(*d*) "Distemper (Etiology and Vaccination)," August 7.

Section III.—Epizootiology.

(*a*) "Anthrax," August 4.
(*b*) "Swine Fever," August 5.
(*c*) "Glanders," August 6.
(*d*) "Sarcoptic Mange of the Horse," August 7.

Section IV.—Veterinary Medicine and Surgery.

(*a*) "Anæsthesia," August 4.
(*b*) "Laminitis," August 5.
(*c*) "Surgical Treatment of Roaring," August 6.
(*d*) "The Use of Drugs in the Treatment of Disease caused by Nematode Worms," August 7.

Section V.—Tropical Diseases.

(*a*) "Diseases Transmitted by Ticks: Their Classification, Treatment and Prevention," August 4.
(*b*) "Diseases Transmitted by Winged Insects: Their Classification, Treatment and Prevention," August 5.

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Section VI.—Zootechny.

"What Influence has Heredity on the Early Development of Affections which Impair the Economic Usefulness of Horses? What are the Manifestations of these Influences that should be Avoided in the Selection of Breeding Animals?" August 6.

PROGRAMME OF RECEPTIONS.

Sunday, August 2.

Reception by the Organizing Committee and Members of the Royal College of Veterinary Surgeons, to be held at the Hotel Cecil, Strand, London, W.C., from 8.30 to 10.30 p.m.

Tuesday, August 4.

Conversazione, given by the Organizing Committee, and Members of the Royal College of Veterinary Surgeons, at the Natural History Museum, South Kensington, to Members of the Congress, from 9 to 11.30 p.m.

Wednesday, August 5.

Official Dinner of the Congress, at the Hotel Cecil. Price of tickets: Gentlemen, £1 1s.; Ladies, 16s.; inclusive of wines and cigars. Members intending to be present should notify the Honorary Secretary before Tuesday, July 28, 1914.

Thursday, August 6.

Dinner to Government Delegates, given by His Majesty's Ministers.

Friday, August 7.

Municipal Reception to Members of the Congress.

NOTICE AS TO DRESS.

For morning and afternoon meetings.—Gentlemen: Morning coat or frock coat. Ladies: Morning dress.

For all evening meetings, receptions, dinner, &c.—Gentlemen: Evening dress. Ladies: Evening dress.

It may be necessary to wear levée dress or uniform for Government and Municipal receptions. Instructions on this point will be given on the cards of invitation.

In order that there may be no mistake about invitations, members are requested to register their names at an early date as well as those of their ladies. Cards of invitation will be required for certain of the receptions, and members who have not received these are requested to apply for them at the Secretary's Office as soon as possible after their arrival in London.

The Office of the Secretary will be at the place of meeting during the Congress, the Central Hall, Westminster, and will be open all day on Saturday, August 1, and from Monday, August 3, till Saturday, August 8.

EXCURSIONS, &c.

The Zoological Gardens, Regent's Park, London, N.W.—The Zoological Society has very generously presented 1,000 tickets for free admission to the Zoological Gardens, for Foreign Members of the Congress only, and available for Sunday, August 2, or Sunday, August 9.

Arrangements have been made for Members to visit the Metropolitan Market, Deptford Cattle Wharf, and Cold Storage Establishments during the week of the Congress.

Sight-seeing Arrangements for Ladies.—A Ladies' Committee is being formed to make arrangements for drives and excursions for lady members.

Excursion to Windsor.

Excursion to Pirbright, Hampton Court, &c., Monday, August 10. Leave London, about 11 a.m., by motor, viâ Kingston, Church Cobham, Byfleet, to Pirbright, to inspect the Cattle Testing Station of the Board of Agriculture, returning viâ Chobham, Chertsey, Hampton Court, Twickenham, Isleworth and Kew Bridge, &c., to London, arriving back about 7 p.m. Fare 6s., providing: (1) Seat in motor conveyance; (2) gratuities to driver; (3) the services of a competent representative to act as interpreter and generally supervise arrangements.

Applications for this excursion should be made early as the catering will require to be arranged in advance.

Tuesday, August 11.—Visits to Breeding Establishments. Arrangements are being made to visit several important breeding establishments, including that of J. B. Joel, Esq., at St. Albans, where the famous "Pretty Polly" may be seen.

TOURS.

Select Conducted Tour to Shakespeare's Country, Tuesday, August 11.—Motor tour, visiting Warwick Castle, Kenilworth Castle, Shottery, Stratford-on-Avon, &c. Leave Stratford-on-Avon at 5.25 p.m., arriving in London about 7.50 p.m.

Conducted Tour to Scotland and the English Lakes, from *Monday, August* 10, to *Saturday, August* 15. Arrangements will be made to visit Clydesdale Studs from Glasgow, and this tour may be slightly modified to meet these requirements for those who wish to take advantage of same. Inclusive fare, £11 11s.

Conducted Tour to Ireland, from *Monday, August* 10, to *Saturday, August* 15. Inclusive fare, £11 7s. 6d.

Conducted Tour to the Isle of Wight and the New Forest, from *Wednesday, August* 12, to *Friday, August* 14. Inclusive fare, £4 15s.

Correspondence.

LONDON ORPHAN ASYLUM.

To the Editor of THE VETERINARY JOURNAL.

DEAR SIR,—Through your courtesy may I inform the workers on behalf of Hilda Tait that she was duly elected to the London

Orphan Asylum, being fifth on the list of successful candidates, and through you may I take the opportunity of thanking the many helpers in the profession who have secured this girl's election.

The hard work they have put into canvassing for the election could only have secured those results.

Yours faithfully,

June 23, 1914. WM. SHIPLEY.

NOTICE.

All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

Letters for the JOURNAL, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements) should be addressed to the Editor.

Manuscript—preferably type-written—should be on one side only of paper, marked with full name of author.

Illustrations for reproduction should be in good black or dark brown on white paper or card.

Advertisements and all business matters relating to the JOURNAL should be addressed to the Manager, VETERINARY JOURNAL, 8, Henrietta Street, W.C.

RANGOON MUNICIPALITY.

WANTED AN ASSISTANT VETERINARY OFFICER.

Applications are invited for the post of Assistant Veterinary Officer to be under the Veterinary Officer of the Rangoon Municipality.

Applicants must be duly qualified Veterinary Surgeons and preference will be given to candidates holding a Diploma in Veterinary Public Health and who have had experience in municipal work. Applicants should state their age and the experience they possess, and should forward *copies* of recent testimonials. Before appointment the successful candidate will be required to undergo a special medical examination by a medical officer to be appointed by the Rangoon Municipal Committee. The successful candidate will, in the first instance, be appointed on probation for one year, on a salary of Rs. 500 per mensem and a horse allowance of Rs. 75 per mensem. If at the end of one year he be confirmed in his appointment, he will be required to sign an agreement to serve the Municipal Committee for a term of two years certain from the date of his confirmation. Thereafter the agreement may be extended by mutual consent to a further period of three years. Subject to the above conditions, the successful candidate will receive salary as follows:—

1st year	Rs. 500 per mensem.	4th year	Rs. 560 per mensem.
2nd ,,	,, 520 ,, ,,	5th ,,	,, 580 ,, ,,
3rd ,,	,, 540 ,, ,,	6th ,,	,, 600 ,, ,,

and in addition thereto a horse allowance of Rs. 75 per mensem. From the date of his confirmation in his appointment the successful candidate will be required to subscribe towards the municipal provident fund, according to the bye-laws in force from time to time.

A first class passage to Rangoon will be allowed to the successful candidate, and a similar return passage will be granted on termination of the appointment according to the provisions of the agreement.

Leave and leave allowances will be granted in accordance with the rules in force for the Indian Services of Government. No exchange compensation or other allowances will be granted.

Applications should reach the undersigned not later than Friday, July 31st, 1914.

OGILVY GILLANDERS & Co., Agents for Rangoon Municipality.

R.1629. 67, Cornhill, London, E.C.